CPCCo Central Plateau Cleanup Company

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Guidance Document

CPCC-GD-SH-29950

PRC-GD-SH-29950

Human Performance Culpability Matrix

Revision 0, Change 0

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Technical Authority: Nye, Lynn
Functional Manager: Hughey, Markis

Use Type: Administrative

- 100 K Facility :
  Excluded from USQ
  Exclusion Reason:
  Excluded from USQ per CPCC-PRO-NS-062, Appendix B
- 324 Facility :
  Excluded from USQ
  Exclusion Reason:
  Excluded from USQ per CPCC-PRO-NS-062, Appendix B
- Canister Storage Building/Interim Storage Area :
  Excluded from USQ
  Exclusion Reason:
  Excluded from USQ per CPCC-PRO-NS-062, Appendix B
- Central Plateau Surveillance and Maintenance :
  Excluded from USQ
  Exclusion Reason:
  Excluded from USQ per CPCC-PRO-NS-062, Appendix B
- PFP Ancillary Structures :
  Excluded from USQ
  Exclusion Reason:
  Excluded from USQ per CPCC-PRO-NS-062, Appendix B
- Plutonium Finishing Plant :
  Excluded from USQ
  Exclusion Reason:
  Excluded from USQ per CPCC-PRO-NS-062, Appendix B
- Solid Waste Operations Complex :
  Excluded from USQ
  Exclusion Reason:
  Excluded from USQ per CPCC-PRO-NS-062, Appendix B
- Transportation :
  Excluded from USQ
  Exclusion Reason:
  Excluded from USQ per CPCC-PRO-NS-062, Appendix B
- Waste Encapsulation Storage Facility :
  Excluded from USQ
  Exclusion Reason:
  Excluded from USQ per CPCC-PRO-NS-062, Appendix B

JHA: Administrative
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Change Summary

Description of Change

Editorial change consists of updating company terminology (CHPRC to CPCCo) and referenced

documents (PRC to CPCC), as well as an update to the current procedure templates, including spell check and updated table of contents.

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1.0 PURPOSE

This guidance document provides a useful tool for management in helping to determine the "culpability" level of an individual in response to events or close calls caused by human error.

2.0 SCOPE

This document is applicable to Central Plateau Cleanup Company (CPCCo) team employees.

3.0 IMPLEMENTATION

This document is effective upon publication.

4.0 DEFINITIONS

Culpability - refers to a state of blameworthiness (e.g., deserving of blame for an error of ignorance, omission, or negligence). Another way to look at it may be that the degree of culpability is roughly equivalent to the amount of personal responsibility one would expect to accept for an act (behavior).

Knowledge-Based Error (KB) (patterns) - a diagnosis error; these are flaws in problem solving and decision making based upon erroneous mental representation or an inaccurate mental picture of the situation, typically based upon insufficient information about the situation.

Rule-Based Error (RB) (if-then) - an interpretation error; here, one does not fully understand or detect conditions calling for a particular response. Examples include the application of the wrong procedure to the situation, or application of the correct procedure to an inaccurately perceived situation.

Skill-Based Error (SB) (auto) - an execution type error; involves a correct understanding of the situation, followed by an unintentional omission, inadvertent slip, preoccupation (resulting in missing a changing condition), inattention, or over attentiveness to a point at which pertinent information is missed.

5.0 APPROACH

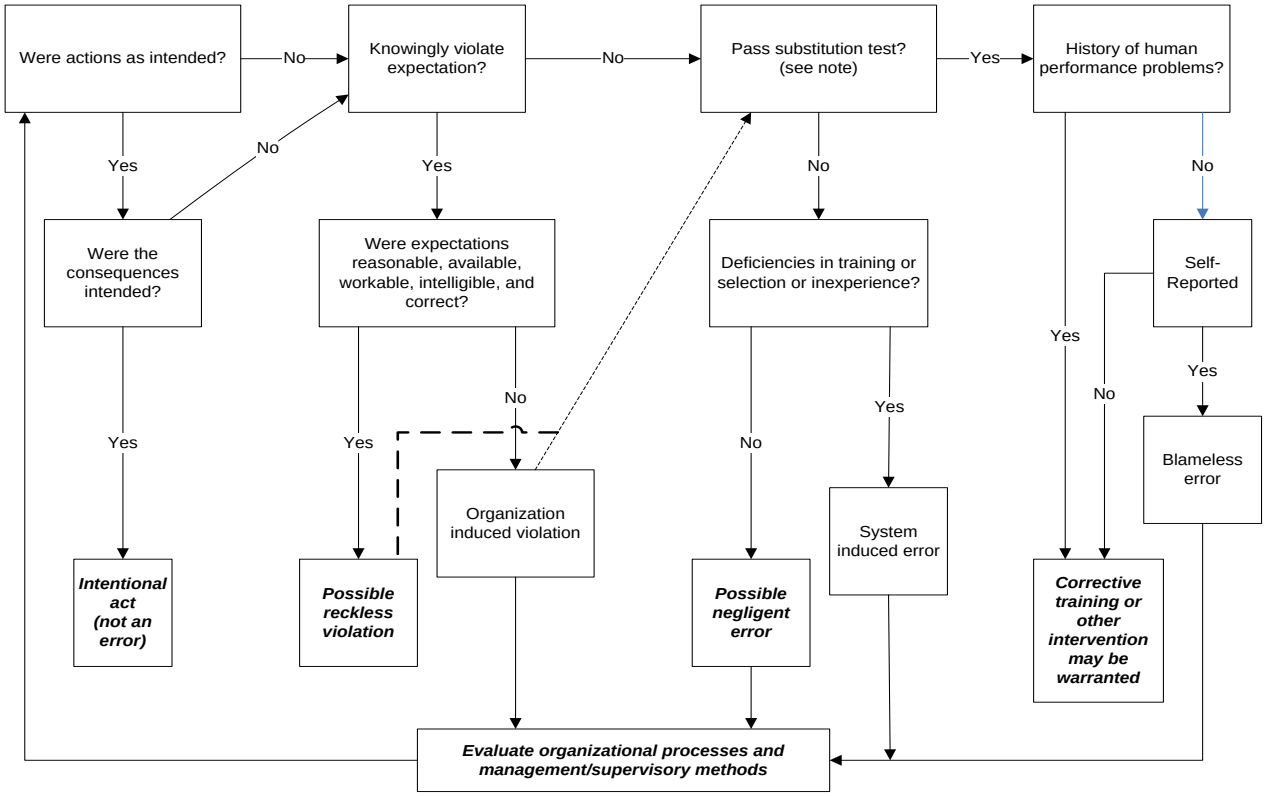
The Human Performance Culpability Matrix process may be used in responding to events that trigger critiques, event investigations, and personal or process improvements. Once facts and timelines are gathered from critiques and interviews are completed from investigations, the results can be used to understand the mindset of the personnel involved, organizational influences, and the context of the situation can be applied to the Human Performance Culpability Matrix to determine if the situation occurred due to individual (knowledge-, rule-, or skill-based) errors or organizational process weaknesses. Knowing the error mode of a situation will aid in determining corrective actions that are appropriate for addressing individual errors and organizational process weaknesses. The results of the Human Performance Culpability Matrix can be used as an aid in determining corrective actions, control measures, recovery actions, and as input into the disciplinary review process.

Fewer and fewer errors will be committed where "just" actions are taken in response to human error. This in turn reduces the frequency and severity of adverse consequences (e.g., events). Responsible adults will take personal responsibility for their actions and will respond accordingly as long as the rules, processes, and consequences are equitable and clearly understood up front.

5.1 Use of the Culpability Matrix Tool

Figure 1 flowchart provides the decision tree to be used in evaluating an error. Appendix A provides information about each block.

Figure 1 – Culpability Matrix Flowchart

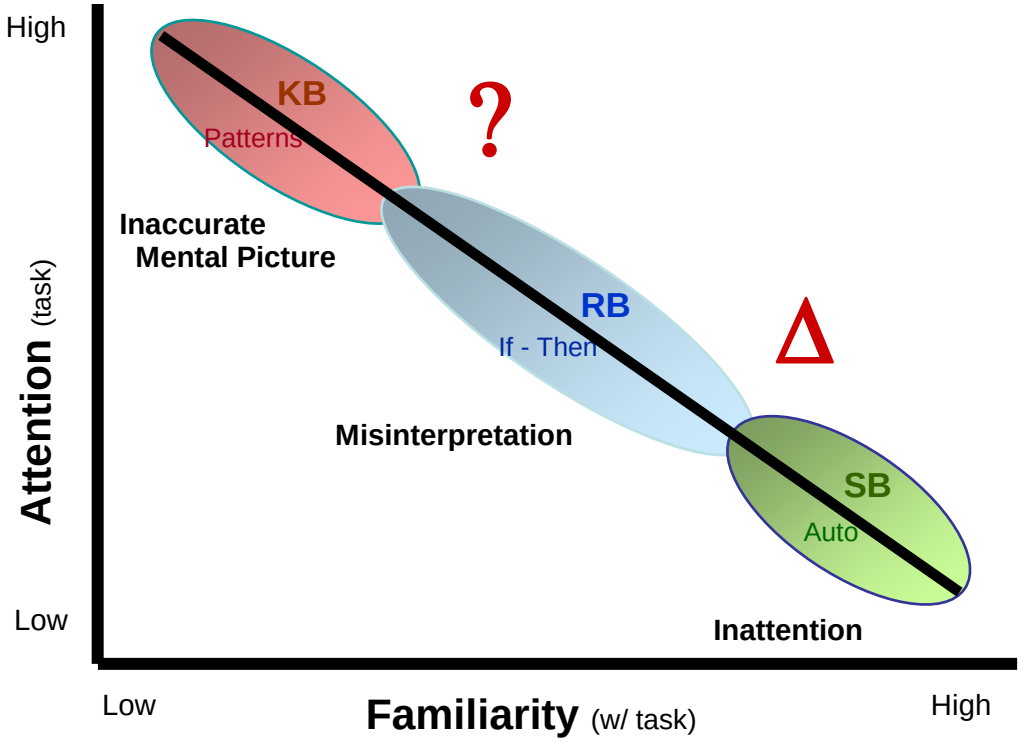


NOTE: *Would other employees have made the same error?*

5.2 Culpability Matrix Flowchart Preparation

The key questions relate to intention. Unintended actions define slips and lapses – in general, the least blameworthy of errors – while unintended consequences cover mistakes and violations. The supervisor and employee should work together to agree upon the specific error being evaluated, and strive for consensus on each of the decision points. The purpose of the review is to identify method of best control, not to question competence. Also, during the evaluation, it is important to understand the type of error you are dealing with (knowledge-, rule-, or skill-based) (Figure 2). This will help you determine what types of corrective measures are required.

Figure 2 – Performance Modes



The following are example suggestions for corrective actions based upon the type of error.

1. Rule-Based Errors

- Clearly delineate key decision points in a procedure
- Eliminate procedure inconsistencies
- Simplify procedures
- Train individuals to skill-based mode (fluency)
- Eliminate drawing and technical manual errors
- Improve knowledge of procedure bases
- Practice using multiple, alternative indications
- Promote practice of verbalizing intentions
- Practice on transitions between procedures
- Eliminate use of “rules of thumb”

2. Skill-Based Errors

- Install blocking devices
- Identify the critical steps
- Increase supervision
- Avoid multi-mode switches
- If distracted, re-read previous 2 or 3 steps in the procedure
- Improve planning
- Improve personal experience with the task
- Eliminate unnecessary time pressure through scheduling
- Rotate individuals
- Practice using skills to maintain job proficiency
- Promote the value of peer checking
- Improve human factors identification and layout of controls

3. Knowledge-Based Errors

- Practice, practice, practice using methodical problem-solving techniques
- Design displays to enhance use without keyboarding
- Practice using team and communication skills
- Assign the role of “devil’s advocate”
- Train on and verify accuracy of system and social mental model
- Use system/component knowledge and fundamental principles of science in unfamiliar problem situations
- It is not desirable to default to the “blameless error” mode continually. Even though many experts claim “a great majority of unsafe acts in high tech environments fall in this category since the system or organization induces most of the errors,” there are strong arguments in favor of disciplining the few who commit egregious unsafe acts. In most organizations, the people in the front line know very well who the habitual rule benders are. Seeing them get away with it on a daily basis does little for morale or the credibility of the disciplinary process. Fair and consistent application of an accountability model serves to reinforce where the boundaries of acceptable behavior lie.

6.0 REFERENCES

CPCC-PRO-EM-058, *Event Initial Investigation and Critique Meeting Process*

CPCC-PRO-SH-077, *Reporting, Investigating, and Managing Health, Safety and Property/Vehicle Events*

www.chpra.wisc.edu/safety.php, Personnel Accountability Policy

Reason, James; *Managing the Risks of Organizational Accidents*, Ashgate Publishing Limited, 1997, pp. 68-83 and pp. 205-213

National Academy for Nuclear Training, *Human Performance Fundamentals Course Reference*, Rev 6, Institute of Nuclear Power Operations, 2002, pp. 28-33

Appendix A - Culpability Matrix Flowchart Block Information

The following information about each Culpability Matrix Flowchart blocks (Figure 1).

Block	Instructions
Were Actions As Intended	If both the actions and consequences were intended, we are out of the error realm and into the arena of intentional acts. These acts are possibly sabotage, malevolent damage, willful violation, etc. If the actions were not as intended (I meant to push Button "A" but somehow pushed Button "B"), then we are probably dealing with a mental slip or lapse. These generally are skill-based errors.
Were the Consequences Intended?	If the actions were as intended, but the consequences were not, then the error was most likely a mistake or violation (not willful). These are rule and knowledge-based errors. If the answer to this question is "NO," proceed to the next section. If "YES," you are probably not dealing with an error at all (intentional act) and should consult your management.
Knowingly Violating Expectation	Reasonable expectations consist of guidance communicated through procedures, policies, work practices, verbally, or just plain common sense. Once again, it is necessary to establish the "intent" of the individual being evaluated. If it is established that the individual was aware of the expectations, but consciously elected not to conform to those expectations, then the answer would be "YES." If the answer is "YES," proceed to the next section. If "NO," proceed to the substitution test. "Intent" will come into play later.
Were Expectations Reasonable, Available, Workable, Intelligible and Correct	The availability, workability, and accuracy of reasonable expectations are an important concept. Once again, this must be evaluated from the perspective of the immediate user. Gaining an understanding of the worker's perception on this matter is important. If it is established that the reasonable expectations were readily available, workable, intelligible, and correct, then the answer would be "YES." If it is established or suspected that non-compliance has become more or less automatic (as happens in the case of routine short-cuts), you should question the accuracy of the expectations. Violations generally involve a conscious decision on the part of the individual to bend or break the rules. However, while the actions are deliberate, the potential bad consequences are not, in contrast to sabotage, etc. If in establishing the intent (or motive) of the violation it can be argued that "the individual was attempting to achieve the proper desired outcome but the situation at hand rendered the expectations unsuitable," then the answer will most likely be "NO" to this question.

Block	Instructions
Were Expectations Reasonable, Available, Workable, Intelligible and Correct (cont.)	If the answer to this question is "YES," then there was a possible reckless violation. If the answer was "NO" or cannot be established, then the error or violation may have been system induced. If it is determined that the violation may have been system induced, proceed to the substitution test. You must also consider another error or violation at this point. The expectation to stop and seek additional guidance in situations like these (unworkable procedures) is generally understood by workers. Failure to adhere to this and other expectations of this nature should be evaluated as separate acts.
Pass Substitution Test	This is probably the most critical and difficult evaluation to conduct. To evaluate this question, we need to perform the following mental test. Substitute the individual concerned with someone else coming from the same domain of activity, possessing comparable qualifications and experience. Then ask the following question: "In the light of how events unfolded and were perceived by those involved ***in real time***, is it likely that this new individual would have behaved any differently?" If the answer is "probably not," then apportioning blame has no material role to play other than possibly to obscure potential systemic deficiencies and blame one of the victims. One method of conducting the substitution test is to ask approximately ten of the individual's peers, "Given the circumstances that prevailed at the time, could you be sure that you would not have committed the same or similar unsafe act (error)?" If the answer again is "probably not," then blame is inappropriate. The answer to the substitution test is "YES." If the answer to the substitution test is "YES," then the error is most likely blameless and you should proceed to the section addressing whether or not the individual has a history of unsafe acts. If the substitution test is not passed, proceed along the "NO" path and evaluate the next section.
Deficiencies in Training and Selection or Inexperience	If it is established that there were no deficiencies in the individual's training, selection, or experience, then a possible negligent error must be considered. In other words, should this task have been assigned to this person in the first place? If there are questions about the person's training, qualification, or selection for the task, then there is a good likelihood that the unsafe act was a largely system-induced error.

Human Performance Culpability Matrix

Appendix A - (Cont.)

Block	Instructions
History of Human Performance Problems	People vary widely and consistently in their liability to everyday slips and lapses. Some individuals are considerably more absentminded than others. For the purpose of determining a "history," one would only consider the documented events involving this individual in the previous 6 months. If the person in question has a history of unsafe acts or errors, it does not necessarily bear upon the culpability of the error committed on this particular occasion. However, it probably indicates the necessity for corrective training or other intervention to reinforce desired performance and take full advantage of lessons learned. Absentmindedness has nothing to do with ability or intelligence. Someone who continually commits errors along these lines would obviously require some individual assistance in overcoming these tendencies. The emphasis here is on improving this individual's performance in their current position or considering other career options that they may be more suited to. Discipline should not be an automatic response. It should only be implemented after carefully considering all options, and in response to a specific problem.
Self-Reporting	Self-reporting can be when the individual notifies management of the error or when the individual acknowledges that an error was made. Self-reporting indicates that the individual is willing to change behaviors and to assist in development of corrective actions. In a just culture, individuals should feel encouraged to self-report without undue concern for negative consequences.
NOTE: *The dotted lines from Possible Reckless Violation and Organization Induced Violation blocks to Pass Substitution Test block indicate the need to perform the Pass Substitution Test to determine the degree the organization has influenced the behavior.*	